The Effectiveness of the Reach for Health Community Youth Service Learning Program in Reducing Early and Unprotected Sex Among Urban Middle School Students

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ABSTRACT

Objectives. This study evaluated the effectiveness of a community youth service (CYS) program in reducing sexual risk behaviors among African American and Latino urban young adolescents.

Methods. A total of 1061 students at 2 urban middle schools were surveyed at baseline and 6-month follow-up. Students at one school were randomly assigned by classroom to receive either the Reach for Health CYS program or the Reach for Health classroom curriculum only. Students at the other school served as controls.

Results. At follow-up, CYS participants reported significantly less recent sexual activity ($P < .05$) and scored lower on a sexual activity index than those in the control condition ($P < .03$). The greatest effect was among eighth graders, who received the most intensive service program ($P < .03$). The benefit of the curriculum-only intervention appeared greatest among students in special education classes.

Conclusions. Well-organized CYS that couples community involvement with classroom health instruction can have a positive impact on the sexual behaviors of young adolescents at risk for HIV, sexually transmitted diseases, and unintended pregnancy. This study also suggests the importance of including students in special education classes in health education programs. (*Am J Public Health.* 1999;89:176–181)

In announcing the April 1997 National Summit on Service, President Clinton called upon "schools and communities in every state to make service a part of the curriculum in high school, and even in middle school."[1] Affirming earlier statements by the Carnegie Council on Adolescent Development and the President's Commission on National and Community Service, he concluded that youth should "be taught the joy and duty of serving and should learn it at the moment when it will have an enduring impact on the rest of their lives."[2–5] Community youth service (CYS) programs are being implemented throughout the country with the goal of helping students learn to contribute to their communities and to understand how classroom lessons connect to real-life experiences.[6]

As described by Schine, "a strong program of community service, structured to give young adolescents an opportunity to participate and to experience the empowerment that comes with making a difference, can be a positive first step" toward addressing some critical health problems.[7] To date, however, there has been little evidence of the effectiveness of such programs in promoting health and reducing risk behaviors that disproportionately threaten the lives of economically disadvantaged adolescents in our nation's urban centers. In this report, we present evaluation findings from the Reach for Health CYS program, an intervention designed to provide opportunities for urban middle school students to participate in organized service experiences that meet community needs.[8] We report on the effectiveness of this intervention in reducing early and unprotected sexual activity among urban youth.

Methods

Study Design

The Reach for Health CYS program builds upon a community-based service program developed through a collaboration between the Medgar Evers College Department of Nursing, Brooklyn School District 13, and community service agencies in East New York, Brooklyn. This program was expanded in 1994 through a research–community partnership with Education Development Center, Inc. The expansion entailed increasing the number of middle school students involved in the Reach for Health intervention to include essentially the entire student body; recruiting additional community service sites to accommodate the greater number of student participants; implementing the companion Reach for Health classroom curriculum and training teachers to deliver its lessons; doubling the number of nursing students from Medgar Evers College participating in the service program and providing them with additional adolescent health and development training;

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and adhering to a study design protocol, including the randomization of classroom assignments to intervention conditions and designation of a comparison site school.

Study Sites and Treatment Assignment

The study sites include 2 large public urban middle schools serving economically disadvantaged minority youth. One school (where the original CYS program was developed) served as the intervention site and the other as the control. The 2 schools together contained a total of 68 classrooms of general and special education students. In the intervention school, classrooms ($n = 35$) were randomly assigned to receive either the core Reach for Health classroom curriculum or this curriculum enhanced by participation in the CYS program. Both intervention conditions are described below.

The school sites were closely matched in terms of having a large and almost exclusively minority student body ($n > 700$ per school; 99% African American and Hispanic); a high-risk health profile (based on rates of violence-related injuries, HIV or sexually transmitted disease infection, teen pregnancy, etc.); a high-risk academic profile (based on below-grade standardized test scores, low attendance, and low high school graduation rates); and limited access to resources (including a Title I poverty index above the New York City average and limited school-based health programs). The majority of students at the schools scored substantially below the New York City average on standardized tests: fewer than a third scored above the 50th percentile in mathematics, and fewer than 40% scored above the 50th percentile in reading. The schools were chosen by a team of New York City Public School Central Board administrators because, while obviously not identical on any index, the schools served essentially similar student populations. Students at the control school receive only standard New York City health education, most of which is delivered in grade 8, with some mandated lessons on drugs and AIDS in grade 7.

The Reach for Health CYS Program

Students who participated in the combined Reach for Health curriculum–plus–CYS program spent approximately 3 hours per week in a community placement. Placements included 4 nursing homes, 1 neighborhood full-service health clinic, 2 child day care centers, and 1 senior citizen center. In their field placements, students performed a variety of tasks associated with social skills and behaviors, including reading to elders; assisting or observing doctors and dentists during medical examinations; answering phones, scheduling appointments, and filing; assisting with meals; and helping with exercise, recreation, and arts and crafts groups. Back in their health classes, students shared their experiences in debriefing sessions used to reinforce skills in decision making, communication, information seeking, health advocacy, and other areas.

The specific CYS assignments varied by grade. Seventh-grade students walked from school to nearby day care centers, where they worked with preschoolers individually and in small groups. Eighth-grade students received a broader program. Over the course of the school year, they each were assigned to 2 different field placements, primarily serving elders from their community. This arrangement provided students with exposure to a variety of health settings and providers and helped maintain their interest. Eighth graders were also provided several additional orientation lessons to prepare them for working in their health care field placements. Both seventh- and eighth-grade students were accompanied to their field sites by their classroom teacher, and some were accompanied by nursing students or faculty from Medgar Evers College. From a total of 35 classrooms in the school, 13 classrooms were randomly assigned to the CYS condition; this number was determined by the time and logistics involved in escorting students off the school campus for their service learning experience.

The Reach for Health Curriculum

The Reach for Health curriculum was delivered to all seventh and eighth graders at the intervention school, including those who participated in the CYS program described above. The framework for the curriculum was adapted from the Teenage Health Teaching Modules,[9] which is one of the most widely used comprehensive health curricula in the nation and is based on the health belief model and theories of social learning.[10–12] Unlike the comprehensive framework of these courses, however, the Reach for Health curriculum focused on 3 primary health risks faced by inner-city adolescents: drug and alcohol use, violence, and sexual behaviors that can result in HIV infection, other sexually transmitted diseases, and unintended pregnancy. Because of this focus, the Teenage Health Teaching Modules lessons were enhanced with key elements from several other nationally recognized curricula, including Being Healthy, Michigan Model, and Contemporary Health Series.[13–15] Extensive curriculum development input from teachers, parents, and students in the study sites was sought throughout the process. The curriculum consisted of 40 core lessons per year for both grades 7 and 8. Because training has been shown to influence both teachers' ability to implement curricula and student outcomes, all teachers delivering the material participated in multiple days of training; they were also provided technical assistance throughout implementation, and their classrooms were observed periodically for adherence to the lesson plans. Twenty-two classrooms were assigned to the curriculum-only condition.

Sample

The sample comprised all 68 seventh and eighth-grade classes, including bilingual and special education classes from the 2 school sites. Written informed consent was required from both parents and students before students could participate in classroom health surveys, which were conducted in fall 1994 and spring 1995. Informed consent procedures have been described elsewhere.[16] Unlike cross-sectional surveys, the evaluation design required tracking individuals to assess changes in knowledge, attitudes, and behaviors. Lists linking student names to code numbers were kept in a computer database away from the school sites, and no names were included on completed questionnaires. The study was approved by the Institutional Review Boards of Education Development Center, Inc, the New York Public Schools, and Columbia University School of Public Health.

In fall 1994, 1157 students completed a baseline survey, representing 74.7% of all eligible students. Twenty percent of parents either did not give consent or failed to return forms. Multiple makeup survey sessions were conducted to ensure that all students who had parental consent were included in the study; of those students with parental consent, 94% were surveyed. Of the 1157 students who completed the fall baseline survey, 1061 completed the spring follow-up (91.7% retention rate). Almost all students who did not complete the spring interview had been discharged from the study sites. All students completing either a baseline or follow-up survey were included in the aggregate descriptive analysis. However, to be included in the longitudinal, multivariate analysis, students had to complete both a fall baseline and a spring follow-up survey.

About half of all participants completing both surveys were eighth graders (48.4%), and 47.2% were male. At baseline, the average ages of seventh and eighth graders were 12.2 and 13.3, respectively;

15.9% of students identified themselves as Hispanic, 79.2% as non-Hispanic Black, and 4.9% as other (including missing data). Of the 1061 students completing both fall and spring surveys, 255 participated in the combined Reach for Health curriculum–CYS intervention, 222 participated in the curriculum-only intervention, and the remaining 584 served as controls.

Measures and Data Analysis

All items were measured through self-report pencil-and-paper questionnaires. Ethnicity was measured through 4 separate items (Are you Black/African American? Are you Hispanic/Latino? Are you White? Are you American Indian?); responses were scored into 3 discrete categories (Hispanic; non-Hispanic Black; other). Youth were asked 4 questions about sexual behaviors at both baseline and follow-up, including lifetime experience with intercourse (yes/no); recent (i.e., last 3 months) intercourse (scored from none to more than twice a week); and use of protection during recent intercourse (one question each about use of condoms and her birth control, coded from always to never). Responses to these questions were dichotomized and are reported separately in the descriptive analysis. In addition, dichotomized responses were combined into an ordinal, 4-category Sex Behavior Index, scored as follows: (1) no lifetime experience with intercourse (virgins); (2) past but no recent intercourse; (3) recent, always protected intercourse (i.e., both condoms and birth control reported as always used); and (4) recent, unprotected intercourse. This measure locates all students along a continuum of risky sex behaviors.

Percentages of youth reporting sexual behaviors were generated for each treatment condition (control, curriculum-only, curriculum-CYS) at baseline and 6-month follow-up.

Delta scores (baseline percentage minus follow-up percentage) were computed and are reported along with baseline percentages to show aggregate changes in sex behaviors by treatment condition for the total sample and for subgroups (i.e., students by grade and special education students). MIXOR, a computer program for mixed-effects ordinal regression analysis, was used to assess the influence of treatment condition on both recent sex and the Sex Behavior Index at follow-up, with control for gender, grade, and baseline sex risk behavior; ethnicity as well as a measure of social desirability were excluded following preliminary analyses because they were not significantly associated with the outcome measures. MIXOR was used because it is appropriate for dichotomous and ordinal-level outcomes and for designs that entail clustered data (i.e., students within classrooms). MIXOR takes into account the effect of clustering by jointly estimating the degree of dependency of data within clusters with the usual regression model parameters.[17]

Results

At fall baseline, 68.2% of the sample reported never having had sex, while 23.1% reported having had intercourse during the prior 3 months (recent sex). Among students reporting recent sex at baseline, 39.7% reported no or inconsistent use of condoms and 45.7% reported no or inconsistent use of birth control. Reports of both lifetime and recent sex were higher at follow-up than baseline, higher among eighth- than seventh-grade students, and higher among males than females (50.1% vs 13.6% for lifetime sex at baseline, 36.6% vs 10.1% for recent sex). By spring of eighth grade, almost half (45.7%) of eighth-grade students reported having had intercourse.

Table 1 shows the percentages of students by treatment condition reporting sexual activity during fall baseline and spring follow-up surveys; figures for both the total sample and the 2 subgroups, eighth graders (who had the most intensive CYS program and the highest base rates of sex) and special education students, are provided. All students present for either the fall or the spring survey are included in this analysis (aggregated sample); thus, the table provides a cross-sectional view of self-reported sex behaviors. Delta scores indicate the extent to which reports of sex behaviors at follow-up differ from those obtained at baseline.

For the whole sample, delta scores are somewhat higher (i.e., there are increases in risk behavior) for students in the control condition than for curriculum-only or CYS participants on each of the outcome measures—ever having had sex, recent sex, and recent sex without a condom or other birth control (among those who reported recent sex). For example, rates of ever having had sex increased by 8.2 percentage points among controls, compared with 3.4 and 4.4 percentage point increases among curriculum-only

TABLE 1—Percentages of Students Reporting Sexual Behaviors by Intervention Condition and by Delta Scores for Changes in Rates Over 6 Months: Reach for Health Community Youth Service Program, Brooklyn, NY

	All Students (%)			Special Education Only (%)			Eighth Graders Only (%)		
	Baseline	Follow-Up	Delta	Baseline	Follow-Up	Delta	Baseline	Follow-Up	Delta
Ever had sex	(n = 1077)	(n = 1132)		(n = 100)	(n = 107)		(n = 534)	(n = 564)	
Control	32.5	40.7	+8.2	34.4	60.5	+26.1	41.5	48.0	+7.5
Curriculum	34.3	37.7	+3.4	45.2	32.4	−12.8	49.1	49.0	−0.1
CYS-plus	27.8	32.2	+4.4	26.9	31.3	+4.4	34.8	36.0	+1.2
Recent sex	(n = 1087)	(n = 1148)		(n = 101)	(n = 107)		(n = 537)	(n = 573)	
Control	22.9	28.2	+5.3	24.2	55.3	+31.1	31.6	34.4	+2.8
Curriculum	25.7	29.1	+3.4	38.1	27.0	−11.1	35.8	37.0	+1.2
CYS-plus	21.0	20.6	−0.4	15.4	18.8	+3.4	26.1	20.6	−5.5
Recent sex without condom[a]	(n = 229)	(n = 266)		(n = 24)	(n = 31)		(n = 155)	(n = 159)	
Control	34.7	37.7	+3.0	42.9	35.3	−7.6	32.6	39.3	+5.7
Curriculum	48.3	35.6	−12.7	57.1	30.0	−27.1	38.9	33.3	−5.6
CYS-plus	42.6	26.7	−15.9	100.0	0.0	−100.0	51.9	21.1	−30.8
Recent sex without birth control[a]	(n = 223)	(n = 252)		(n = 25)	(n = 30)		(n = 155)	(n = 151)	
Control	38.1	46.1	+9.0	33.3	55.6	+22.3	36.7	46.6	+11.9
Curriculum	58.6	53.6	−5.0	53.3	33.3	−22.0	51.4	41.9	−9.5
CYS-plus	48.9	40.5	−8.4	50.0	0.0	−50.0	57.1	29.4	−27.0

[a]Among those reporting recent sex.

and CYS participants, respectively. Similarly, while rates of recent sex increased 3 percentage points among controls, they decreased 12.7 percentage points among curriculum-only students and 15.9 percentage points among CYS participants. Differences in delta scores by condition were greater among eighth graders and special education students. While among special education controls there was an increase of 26.1 percentage points in ever having had sex, there was a decrease of 12.8 percentage points among special education students enrolled in the curriculum-only condition and only a 4.4 percentage point increase among those in CYS; this pattern was consistent across all behaviors. Among eighth graders, differences were greatest on indicators of unprotected sex; whereas rates of sex without a condom or other birth control increased for controls, they decreased for both curriculum-only and CYS participants, with the greatest decreases (–30.8 percentage points for sex without a condom and –27.7 percentage points for sex without any birth control) among CYS participants.

We also examined changes in sex behavior at the individual level by treatment condition (not shown). These results also suggest positive intervention effects. Among those reporting no experience with intercourse at baseline, only 13.0% (21/162) of CYS participants reported having had sex by follow-up, compared with 17.3% (23/133) of curriculum-only participants and 21.2% (76/359) of control students. CYS participants who were not virgins at baseline were also less likely to report recent sex at follow-up. Among nonvirgin controls, 59.4% (95/160) reported recent sex, compared with 60.9% (39/64) assigned to curriculum only and 51.5% (34/66) of CYS participants. Thus, both aggregate-level and individual-level descriptive statistics suggest positive effects, especially for participants in the CYS program.

Table 2 shows the effects of treatment condition on whether students had recent sex, controlling for recent sex reported at baseline, gender, and grade and adjusting for classroom-level clustering. Students participating in the CYS program were significantly less likely ($P < .05$) to report recent intercourse at follow-up than were youth in the control condition; there was no significant difference in whether students had recent sex, however, between students in the curriculum-only condition and those in the control school. Because the CYS program was broader for eighth than for seventh graders, we also tested whether the intervention effect varied by grade by entering a cross-product interaction term into the analysis (data not shown). Results indicated a trend-level interaction ($P < .08$) between grade, CYS participation, and changes in reports of recent intercourse. The positive effect of participating in the CYS intervention was stronger for eighth than for seventh graders. As expected, boys and students reporting recent sex at baseline were also more likely to report it at follow-up.

TABLE 2—Logistic Regression Analysis of Recent Sex at 6-Month Follow-up on Intervention vs Control Exposure, Controlling for Potentially Confounding Variables (n = 959): Reach for Health Community Health Service Program, Brooklyn, NY

Variable	Estimate[a]	SE
Baseline sexual risk behavior	1.912	0.225***
CYS vs controls	–0.538	0.262**
RFH curriculum only vs controls	–0.177	0.282
Male vs female	1.245	0.198***
Grade in school (7 vs 8)	0.399	0.240*
Intercept	–2.313	0.269***

Note. CYS = Community Youth Service; RFH = Reach for Health.
[a]Logistic regression effect estimate.
*$P < .10$; **$P < .05$; ***$P < .001$.

TABLE 3—Logistic Regression Analysis of Sexual Risk Behavior Index at 6-Month Follow-up on Intervention vs Control Exposure, Controlling for Potentially Confounding Variables (n = 924): Reach for Health Community Youth Service Program, Brooklyn, NY

Variable	Estimate[a]	SE
Baseline sexual risk behavior	0.868	0.074***
CYS vs controls	–0.512	0.223**
RFH curriculum only vs controls	0.423	0.225*
Male vs female	1.040	0.183***
Grade in school (7 vs 8)	0.339	0.188*
Intercept	–2.539	0.201***

Note. CYS = Community Youth Service; RFH = Reach for Health.
[a]Logistic regression effect estimate.
*$P < .08$; **$P < .05$; ***$P < .001$.

Table 3 shows the effects of treatment condition on the 4-category Sex Behavior Index measured at follow-up, controlling for gender, grade, and baseline index scores. Students participating in the CYS program scored significantly lower ($P < .03$) on the Sex Behavior Index at the end of the school term than did youth in the control condition. Furthermore, there was a trend-level effect for the curriculum-only condition ($P < .08$); compared with youth in the control school, curriculum-only students scored lower on the Sex Behavior Index, controlling for baseline behavior, gender, and grade. Unlike results for recent sex, there was no statistically significant interaction between grade, CYS participation, and changes in reports of recent intercourse on this composite measure of risky sex behavior, although the valence of the interaction term was the same.

In summary, participation in the CYS program appears to have had a clear benefit. Participants received the broadest and most intense intervention through both exposure to the Reach for Health curriculum throughout the school year and spending several hours each week providing service in child care and health care settings in their community. There is also evidence of a positive—although weaker—effect for curriculum-only intervention, with participants faring better on the Sex Behavior Index than students attending the control school. Indeed, although the numbers of students are relatively small, the curriculum may be especially effective for students attending special education classes—youth who often are excluded from prevention research.

Discussion

The President's Commission on National and Community Service presented a vision of schools as a place where "young people are called not only to academic achievement but to volunteer work in hospitals and nursing homes, tutoring programs, and homeless shelters as a fundamental component of education."[4(p3)] Although voices have been raised in support of youth service, evidence of the benefits on student outcomes has been limited. Since such programs often grow from grassroots efforts and operate with

limited resources, it has been difficult to assess their effectiveness in terms of specific outcomes.[18] Our study provides evidence of the benefits of participation in CYS on an important health outcome—the reduction of early and unprotected sex among high-risk young urban adolescents. Students participating in CYS plus health instruction were more likely than controls to report that they were sexually abstinent or, if sexually active, that they always used protection.

There is some indication that the CYS program was most effective for reducing recent sex among eighth graders. This differential impact could be due to built-in programmatic differences: the experience of walking across the street to work in a child care center (the seventh-grade program) may not be as compelling as providing service in several community health sites over the course of the year, with students' greater exposure to health care personnel and community elders (the eighth-grade program). It is also possible that higher rates of sex overall among older students make it easier to document differences among experimental groups, or that older students may indeed benefit to a greater degree from such community involvement. Questions regarding how intensive a community service program must be to yield positive benefits, as well as what age groups of students may benefit most, are important, given the substantial programming and resource issues required to incorporate service learning into school programs. One limitation of our study is that we cannot determine whether it is the students' age or the intensity of the experience that results in greater benefits; this should be addressed in future research. Nor can we tell whether CYS, in the absence of health instruction in the classroom, will be equally effective. Additional research is also needed to understand the mechanisms through which service learning may have an impact: Is the CYS intervention effective because it provides youth with the opportunity to experience the sense of self-efficacy and empowerment that comes from being asked to do something meaningful and doing it well, or because it provides students with critical mentoring, greater bonds to mainstream social institutions, or something else?[19–23]

Although not statistically significant, there are trend-level reductions in sexual activity among students who participated in the curriculum-only condition. While the curriculum includes all the elements identified by Kirby and others as being essential to successful sex risk–reduction programs,[12] a growing body of evidence suggests the limitations of curriculum-only approaches in producing desired behavior changes.[24–27] It is possible that the benefits of the Reach for Health curriculum will be greater among students who receive a full 2-year middle school program of health instruction (rather than the 1-year curriculum evaluated here); in the future, we will be following a cohort of students who receive a multiyear instructional intervention.

Although the numbers of special education students are small and our findings are not definitive, it is noteworthy that this group appears to experience some of the greatest benefits of the curriculum alone. The Reach for Health lessons were adapted for special education classrooms, and special education teachers were included in training and provided ongoing technical assistance to support intervention delivery. Unfortunately, in many circumstances, despite their levels of risk behaviors, special education students are not provided standard health instruction or included in evaluations; this study suggests that their inclusion is both possible and potentially effective in reducing sexual risks.

It is important to note that this evaluation was made possible through a research–community partnership; it was the community, not a research team, that developed and nurtured the CYS intervention and understood the importance of evaluating its impact on students. The research team provided the skills and resources that allowed evaluation of the program. This type of partnership has some major advantages, as well as a few limitations, in terms of generalizability to other circumstances. Programs that are based in and embraced by the community are likely to be sustainable, a critical intervention goal; communities that support such innovation may also be different from those that do not, even if, as in this study, the risk behaviors of students are similar to those in other situations. Having shown that a CYS program can be effective in an environment that supports its growth, showing that it can be replicated in new settings, with similar results, will be equally important.

We have focused on the link between participation in CYS and the risk outcome of early and unprotected sex because of the compelling level of risk faced by youth in the inner-city communities in which we are working. Given trends toward even earlier involvement in sexual activity, programs that successfully encourage abstinence and the use of protection are essential to students' health. Clearly, there may be additional potential benefits of service learning, including its potential contributions to students' academic achievement and their emotional and social well-being and to the development of civic pride and participation. Indeed, in addition to showing how students in urban schools can benefit from extending classroom learning to the community, an important outcome of our work is to show that by working collaboratively, teachers, school administrators, nursing faculty, college students, and staff at community health services can involve young adolescents in a program that makes a tangible difference in their lives. □

Contributors

Lydia O'Donnell, principal investigator, oversaw all aspects of the study, including research design, instrumentation, and data analysis. Ann Stueve, as senior methodologist, was in charge of data analyses and contributed to the development of the questionnaire. Lydia O'Donnell and Ann Stueve were the main writers of the paper. Alexi San Doval, Richard Duran, Deborah Haber, and Rebecca Atnafou participated in the planning of the study, oversaw implementation of both classroom and community service interventions, and contributed to the design of process evaluation instruments to document program implementation. Norma Johnson, Uda Grant, Helen Murray, and Patricia Piessens contributed to the conceptualization of the community service intervention and collection of process evaluation data. Greg Juhn and Julia Tang conducted background research. All authors contributed to the writing of the paper and are guarantors of the integrity of the research.

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References

1. Clinton WJ. Radio Address of the President to the Nation [transcript]. Washington, DC; White House Office of the Press Secretary. April 5, 1997.
2. Carnegie Council on Adolescent Development. *Turning Points: Preparing American Youth for the 21st Century*. Washington, DC: Carnegie Corporation of New York; 1989.
3. Carnegie Council on Adolescent Development. *Great Transitions: Preparing Adolescents for a New Century*. Washington, DC: Carnegie Corporation of New York; 1995.
4. Commission on National and Community Service. *What You Can Do for Your Country*.

Washington, DC: Commission on National and Community Service; 1993.
5. Lewis B. Today's kids care about social action. *Educ Leadership*. 1991;49:47–49.
6. Shumer R, Belbas B. What we know about service learning. *Educ Urban Soc*. 1996;28: 208–223.
7. Schine J. A rationale for youth community service. *Soc Policy*. 1990;20:10.
8. Schine J. *Connections: Service Learning in the Middle Grades*. New York, NY: Center for Advanced Study in Education, City University of New York; 1991.
9. Education Development Center. *Teenage Health Teaching Modules*. Newton, Mass: Education Development Center Inc; 1991.
10. Rosenstock IM. The health belief model: explaining health behavior through expectancies. In: Glanz K, Lewis FM, Rimer BK, eds. *Health Behavior and Health Education*. San Francisco, Calif: Jossey-Bass; 1990.
11. Kazdin AE. Treatment of antisocial behavior in children: current status and future directions. *Psychol Bull*. 1987;102:189–203.
12. Kirby K, Barth R, Leland N, Fetro J. Reducing the risk: impact of a new curriculum on sexual risk-taking. *Fam Plann Perspect*. 1991;23:253–263.
13. New York Academy of Medicine. *Being Healthy*. New York, NY: New York Academy of Medicine; 1989.
14. Michigan Dept of Education. *Michigan Model*. Lansing, Mich: Michigan Dept of Education; 1989.
15. Network Publications. *Contemporary Health Series*. Santa Cruz, Calif: Network Publications; 1989.
16. O'Donnell L, Duran RH, San Doval A, Breslin M, Juhn G, Stueve A. Obtaining written parental consent for school-based health surveys of urban young adolescents. *J Adolesc Health*. 1997;2:376–383.
17. Hedeker D, Gibbons RD. MIXOR: A computer program for mixed-effects ordinal regression analysis. *Comput Methods Programs Biomedicine*. 1996;49:157–176.
18. Kraft RJ. Service Learning: an introduction to its theory, practice, and effects. *Educ Urban Soc*. 1996;28:131–159.
19. Conrad D, Hedin D. School-based community service: what we know from research and theory. *Phi Delta Kappan*. 1991;72:743–749.
20. Melchior A, Orr L. *Overview: National Evaluation of Serve-America*. Cambridge, Mass: Abt Associates; 1995.
21. Calabrese RL, Schumer H. The effects of service activities on adolescent alienation. *Adolescence*. 1996;21:675–687.
22. Benson RL, Roehlkepartain EC. Kids who care: meeting the challenge of youth service involvement. *Search Institute Source*.1991; 12:1.
23. Allen JP, Kupermine G, Philliber S, Herre K. Programmatic prevention of adolescent behaviors: the role of autonomy, relatedness, and volunteer service in the Teen Outreach Program. *Am J Community Psychol*. 1994;22:617–638.
24. Lavin AT. Comprehensive school health education: barriers and opportunities. *J School Health*. 1993;63:24–27.
25. Connell DB, Turner RR, Mason EF. Summary of findings of the school health education evaluation: health promotion effectiveness, implementation, and costs. *J School Health*. 1985;55:316–321.
26. Bosworth K, Sailes J. Content and teaching strategies in 10 selected drug abuse prevention curricula. *J School Health*. 1993;63:247–253.
27. Hansen WB. School-based substance abuse prevention: a review of the state of the art in curriculum. *Health Educ Res*. 1992;7:403–430.